Removal of metals from electroplating wastes using banana pith

ABSTRACT

Banana pith (Musacea zingiberales) was evaluated for its ability to sorb metal ions from electroplating waste and synthetic solutions under both batch- and continuous-flow conditions. Sorption was both pH and concentration dependent, with pH 4·5 being the optimum value. The equilibrium data followed the Langmuir isotherm model with maximum capacities of 8·55 and 13·46 mg/g for Cu in electroplating waste and synthetic solution respectively. Competitive studies showed that the affinity of metal sorption was in the order Pb(II) > Cu(II) > Ni(II) > Cr(III) > Zn(II). In the continuous-flow studies, breakthrough curves for Cu(II) and Ni(II) in the elctroplating waste were obtained at different bed depths and flow rates. Cu(II) was more satisfactorily sorbed on the banana pith than Ni(II).

Keyword: Sorption; Banana pith; Electroplating waste; Cu(II); Ni(II)